

Application No. 09/772,662
Response to Office Action

Customer No. 01933

Listing of Claims:

Claims 1-4 (Canceled).

5. (Currently Amended) The An imaging apparatus according to claim 3, comprising:an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;
5 dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal;10 dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting a clip level for a subject component of the imaging signal, based on the detected dark output level; and15 test imaging means for capturing a test image by performing a charge storage and readout operation of said imaging device for a test imaging time while shielding said imaging device from exposure;20 wherein the dark output level detection means detects the dark output level by deriving a dark output level of an actual imaging based on said test imaging time, an imaging device output level obtained by said test imaging means, and a charge storage time for exposure control of the actual imaging; and

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wherein the test imaging time and the charge storage time ~~at~~ of the actual imaging ~~time~~ are different from each other, and the dark output level ~~at~~ of the actual imaging time is derived by multiplying the imaging device output level X obtained by said test imaging means by a ratio Y/Z of the test imaging time Y of said test imaging means to the charge storage time Z for exposure control at the actual imaging time.

25 6. (Currently Amended) The imaging apparatus according to claim 5, wherein the test imaging time is shorter than the charge storage time ~~at~~ of the actual imaging time.

Claims 7-9 (Canceled).

10. (Currently Amended) ~~The~~ An imaging apparatus according to claim 8, comprising:

5 an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;
dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal;

dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting

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10 an effective gain for a subject component of the imaging signal,
based on the detected dark output level; and
test imaging means for capturing a test image by performing
a charge storage and readout operation of said imaging device for
a test imaging time while shielding said imaging device from
15 exposure;
wherein the dark output level detection means detects the
dark output level by deriving a dark output level of an actual
imaging based on said test imaging time, an imaging device output
level obtained by said test imaging means, and a charge storage
20 time for exposure control of the actual imaging; and
wherein the test imaging time and the charge storage time at
of the actual imaging time are different from each other, and the
dark output level at of the actual imaging time is derived by
multiplying the imaging device output level X obtained by said
25 test imaging means by a ratio Y/Z of the test imaging time Y of
said test imaging means to the charge storage time Z for exposure
control at the actual imaging time.

11. (Currently Amended) The imaging apparatus according to
claim 10, wherein the test imaging time is shorter than the
charge storage time at of the actual imaging time.

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12. (Currently Amended) ~~The~~ An imaging apparatus according to ~~claim 7, comprising:~~

an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;
dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal; and

dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting an effective gain for a subject component of the imaging signal, based on the detected dark output level;

wherein a value of the effective gain set by said dark output correction means is determined based on a resultant value obtained by dividing "a (i) a value corresponding to the a saturation level on the an output side of said dark output correction means" means by (ii) a difference between "a a value corresponding to the a saturation level on the an input side of said dark output correction means" means and "the a maximum value of the dark output level detected by said dark output level detecting means" means.

13. (Currently Amended) The imaging apparatus according to claim 12, wherein the value of the effective gain set by said

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dark output correction means is not smaller than ~~the said~~
~~resultant value of the above division.~~

14. (Original) The imaging apparatus according to claim 13,
wherein the value of the effective gain set by said dark output
correction means is controlled in a stepwise fashion.

15. (Currently Amended) The imaging apparatus according to
claim 12, wherein the value of the effective gain set by said
dark output correction means is equal to ~~the said~~ resultant value
~~of the above division.~~

Claims 16-20 (Canceled).

21. (Currently Amended) ~~The~~ An imaging apparatus according
to ~~claim 19;~~ comprising:

5 an imaging device which includes a plurality of pixels
arranged two-dimensionally, and which outputs an imaging signal;
dark output level detecting means for detecting, for each of
the plurality of pixels, a dark output level superposed on the
imaging signal;

dark output correction means for correcting the imaging
signal based on the detected dark output level, and for setting a

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10 clip level and an effective gain for the corrected imaging
signal, based on the detected dark output level; and
test imaging means for capturing a test image by performing
a charge storage and readout operation of said imaging device for
a test imaging time while shielding said imaging device from
15 exposure;
wherein the dark output level detection means detects the
dark output level by deriving a dark output level of an actual
imaging based on said test imaging time, an imaging device output
level obtained by said test imaging means, and a charge storage
20 time for exposure control of the actual imaging; and
wherein the test imaging time and the charge storage time at
of the actual imaging time are different from each other, and the
dark output level at of the actual imaging time is derived by
multiplying the imaging device output level X obtained by said
25 test imaging means by a ratio Y/Z of the test imaging time Y of
said test imaging means to the charge storage time Z for exposure
control at the actual imaging time.

22. (Currently Amended) The imaging apparatus according to
claim 21, wherein the test imaging time is shorter than the
charge storage time at of the actual imaging time.

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23. (Currently Amended) ~~The~~ An imaging apparatus according to claim 17, comprising:

an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;
5 dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal; and

10 dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting a clip level and an effective gain for the corrected imaging signal, based on the detected dark output level;

15 wherein a value of the effective gain set by said dark output correction means is determined based on a resultant value obtained by dividing "a (i) a value corresponding to the a saturation level on the an output side of said dark output correction means" means" by "(ii) a difference between "a a value corresponding to the a saturation level on the an input side of said dark output correction means" means and "the a maximum value of the dark output level detected by said dark output level 20 detecting means" means."

24. (Currently Amended) The imaging apparatus according to claim 23, wherein the value of the effective gain set by said

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dark output correction means is not smaller than ~~the said~~
~~resultant value of the above division.~~

25. (Original) The imaging apparatus according to claim 24, wherein the value of the effective gain set by said dark output correction means is controlled in a stepwise fashion.

26. (Currently Amended) The imaging apparatus according to claim 23, wherein the value of the effective gain set by said dark output correction means is equal to ~~the said~~ resultant value of ~~the above division.~~

Claim 27 (Canceled).

28. (Currently Amended) An imaging apparatus comprising: an imaging device ~~having which includes~~ a plurality of pixels arranged ~~in a two dimensional fashion two-dimensionally, and which outputs and imaging signal;~~

5 dark output level detecting means for detecting, ~~for each of the plurality of pixels, a dark output level for each pixel superposed on an the imaging signal which is an output signal of the imaging device;~~

10 dark output correction means for correcting the imaging signal by eliminating a dark output component from the imaging

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signal for said each pixel based on the detected dark output level ~~detected by said dark output level detecting means, for~~ setting a clip level for the corrected imaging signal according to ~~the~~ based on a maximum value of the detected dark output level, ~~detected by said dark output level detecting means and for~~ setting an effective gain for the corrected imaging signal according to ~~based on~~ the set clip level; and

15 exposure correction means for correcting exposure of said imaging device according to ~~based on~~ the set gain ~~setting in~~ said

20 ~~dark output correction means.~~

Claim 29 (Canceled).

30. (Currently Amended) An imaging method comprising the ~~steps of:~~

imaging a subject ~~by use of~~ with an imaging device which has includes a plurality of pixels arranged in a two-dimensional 5 ~~fashion~~ two-dimensionally, and which outputs an imaging signal; detecting, for each of the plurality of pixels, a dark output level ~~for each pixel~~ superposed on an the imaging signal obtained by imaging the subject;

10 correcting the imaging signal based on the detected dark output level;

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setting a clip level for the corrected imaging signal
~~according to~~ based on the detected dark output level;

setting an effective gain for the corrected imaging signal
~~according to~~ based on the set clip level; and

15 controlling exposure of the imaging device according to the
set gain.